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The Effect of Reimbursement on Physician Services and Incomes From Medicare and Medicaid: Executive Summary

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I. Overview

This paper provides a summary of the major findings from a HFCA grant entitled "The Effect of Reimbursement Policies on Physician Services and Incomes from Medicare and Medicaid." The study was designed to analyze physician responses to reimbursement policies established by Medicare and Medicaid. Two important policy initiatives in each program were studied. In Medicare, we examined the controls imposed during the 1972-1974 Economic Stabilization Program and the Economic Index introduced on July 1, 1975. Our concern was whether and to what extent physicians responded by changing service delivery patterns, accepting assignment of claims, etc. In Medicaid we analyzed physician response to a freeze on fees in California between 1974 and 1976. This was of particular interest because severe fee controls are a rather common practice of many Medicaid programs, especially those in large urbanized states. The California Medicaid program also raised fees in September 1976 in a way that provided significant incentives for primary care physicians to increase participation in the program. Since it is rare to find a natural "experiment" which tests the effect of a change in relative prices facing physicians, this policy initiative was of great interest.

This paper reports on seven separate studies. Each uses a common data base, derived from physicians claims data provided to us by Blue Shield of California and the Occidental Insurance Company. The data consists of all Medicare and Medicaid claims submitted during the same three month period over a seven year period, 1972-1978, by 5000 solo practice physicians and over 350 groups. All but one study used only the data on solo practice physicians. The data set is extremely rich in its detail on procedure definitions, charges and allowed fees. The cross sectional nature of the data base permitted a considerable degree of disaggregation by specialty and type of procedure. The time series feature permits analysis of the same physicians' behavior as new policies are initiated.

The first study, "Price Controls, Physician Fees, Output and Revenue from Public Medical Programs: Evidence from Four Specialties", examines the response of orthopedic surgeons, opthamalogists, radiologists and anesthesiologists to fee controls under the Economic Stabilization Program (ESP). The study found that physicians provided more services and were less likely to accept assignment; as a result the percentage increase in Medicare payments to physicians increased by considerably more than ESP's allowed percentage increase in fees.

The second study, "The Medicare Assignment Rates of Physicians: Their Responses to Changes in Reimbursement Policy", examined how assignment rates of physicians responded to Medicare fee changes. The study concludes that assignment rates are very responsive to Medicare rates. However, assignment rates also respond to changes in private market prices which are increasing simultaneously. In fact, upward adjustments in Medicare rates are partially responsive for the increase in private rates. The net result is that increases in Medicare reimbursement rates, so long as private charges are not controlled, will have little effect on assignment rates. At the same time however, control over Medicare rates without comparable controls over private rates will reduce assignment rates and shift some of the financial burden to beneficiaries. Another implication of the model used in the study is that increases in Medicare rates which exceed increases in private charges would increase the quantities of both assigned and non-assigned services. While the effect on the assignment rate is hard to predict, more overall services would be provided to Medicare beneficiaries.

The third study, "An Analysis of Changes in Physicians Medicare Revenues", examined changes in physicians services and revenues before and after the introduction of the Economic Index. The study found that the Index only had a significantly constraining effect on Medicare rates in its first year. There was also a reduction in physician participation in Medicare, a shift from assigned to non-assigned billing and an increase in patient financial burden.

The fourth study, "Medicaid Fee Controls and Physician Behavior: Preliminary Evidence from California", examined physician participation in Medicaid during two very different periods: 1974-1976 when fees were frozen at the same time that private rates were climbing rapidly, and 1976-1978 when California increased fees by an average of 20 percent, with greater percentage increases for primary care services and smaller percentage increases for surgery, radiology and pathology. The study found that despite the controls, participation rates and services per participating physician increased for most specialties. We concluded that even low Medicaid rates must have exceeded the marginal costs of providing services at least for many physicians. This could have occurred because the increasing supply of physicians made Medicaid patients more attractive. After the fee schedule increase, we found that primary care physicians markedly increased the number of patients they treated.

The fifth study, "The Effects of Medicaid and Private Fees on Physician Participation in California's Medicaid Program, 1974-1978", provided further analysis of the same data. The central issue was whether other factors such as changes in eligibility, the supply of physicians, wage costs, etc., were responsible for the effects observed in the previous study. The results confirmed that increases in Medicaid fees had major effects on the supply of services provided to Medicaid patients. The effect again was primarily on the number of patients seen per participating physician. The study also found that while the one-time Medicaid fee increase had substantial effects, the continued increases in private fees eventually more than offset the Medicaid fee charge. The increasing supply of physicians was also found to increase the willingness of physicians to provide services to Medicaid patients.

The sixth study, "The Provision of Medicaid Services by Group Physicians", analyzed data on group practice physicians to see if they responded to Medicaid fee policies in the same way as solo practitioners. The study demonstrated that group physicians responded in the same directions but even more strongly than solo practice physicians. Participation rates and the number of patients per group increased by greater percentages than we observed in the solo practice study.

The final study, "A Comparison of Practice Patterns of New and Established Physicians: California, 1978", compared new and established physicians to test for differences in charge levels, public program participation and service delivery patterns. The study found that new physicians had higher charges and were less likely to participate in either Medicare and Medicaid than established physicians. Those new physicians who did participate in Medicaid had heavier patient loads than established physicians, while the opposite pattern was observed in Medicare. We did not find that new physicians saw their patients more frequently or performed more ancillary services.

II. Summaries of Individual Studies

A. Price Controls, Physician Fees, Output and Revenue from Public Medical Programs: Evidence from Four Specialties

In the first study completed under the grant, Lynn Paringer analyzed changes in physicians' prices, output and revenue from Medicare during the Economic Stabilization Program and in the year following removal of the price controls. The analysis in this paper focused on the specialties of ophthalmology, orthopedic surgery, radiology, and anesthesiology. (A previous Urban Institute paper by Holahan and Scanlon analyzed the effect of price controls on three other specialty groups: general practitioners, internists, and general surgeons[1]). The data base included all claims paid to the physicians during the second quarter of each year for the period 1972-1975.

The Economic Stabilization Program (ESP) was implemented in 1971 because of national concern about the increasing rate of inflation in the U.S. economy in the early 1970s. The objective of ESP in the medical services sector was to contain the rate of increase in the aggregate price of physicians' services to 2.5 percent per year. During the five year period prior to controls, physicians' fees rose at an average rate of 7 percent per year. While the process of applying ESP controls to Medicare was rather involved, the resulting effect was a severe restriction on increases in physicians' fees paid by the programs during 1973 and 1974. After the removal of controls in 1974, fees were permitted to increase in accord with Medicare's customary-prevailing methods.

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[1] John Holahan and William Scanlon, "Price Controls, Physician Fees and Physician Incomes from Medicare and Medicaid" (Washington, D.C.: The Urban Institute, 1978).

This study examined the effects of controls on the billing behavior of physicians both during the control period and in the year following removal of controls. Rates of increase in both billed charges and allowed amounts during the control years were compared with the rates of increase after controls were lifted.[2] Price controls, as applied during ESP, were structured to limit the rate of price increase in a typical market basket of goods being provided by physicians in 1972. Because controls were applied to this unique bundle of goods they did not constrain the price increase which physicians could receive by altering the mix of services toward more complex, expensive procedures. In addition, physicians could increase total revenue by increasing the number of services provided. The paper investigated both of these possible responses to the ESP program.

The principal finding of this study was that, while price controls were effective in restraining the per unit price increase of physicians' services, they did little to control the amount of revenue which physicians received from Medicare. Physicians responded to the price controls in two major ways: (1) they increased the number of services provided and (2) shifted to a more complex mix of services for procedures such as office visits.

In the first year of price controls the Medicare revenue of physicians in each of the specialties increased between 12 and 27 percent. The second year of controls also witnessed relatively large increases in revenue (between 12 I. and 20 percent). By contrast, in the year following controls, Medicare revenue for every specialty but orthopedic surgeons declined. The relatively large increase in revenue occurring during the price control years was due to an increase in services provided and a shift in the mix of services.

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[2] Medicare reimburses physicians on the basis of customary, prevailing and reasonable charges. The allowed amount reimbursement rate is the lowest of the physician's actual charge, the physicians' median charge in a recent prior period (customary) or the 75th percentile of charges in that same period (prevailing). Since September 1976, the prevailings are less than the 75th percentile because of the "Economic Index", which is explained later.

One of the most significant changes during the price control period was the shift toward an increasing proportion of revenue coming from non-assigned claims. By accepting patients on assignment, the physician agrees to accept the Medicare reimbursement rate as payment in full for his/her services. By refusing assignment, the physician increases the cost burden on Medicare beneficiaries and can receive the full difference between his/her charge and the Medicare payment. With the exception of anesthesiologists, non-assigned revenue grew substantially faster than assigned revenue throughout the study period.

The principal findings in this study parallel the results found in the Holahan-Scanlon study of the behavior of physicians in the specialties of general practice, general surgery and internal medicine. That study found that the Medicare incomes of physicians in the sample increased more during the two years of price controls than in the year following controls. During the first year of controls, the Medicare revenues of general practitioners, general surgeons and internists increased between 10 and 12 percent. In the second control year the revenues rose by 12 to 19 percent. Most of the increased incomes in this two year period resulted from increases in the number of services provided. Once controls ended, both the rate of increase in income and in the number of services provided to Medicare patients fell. The Holahan-Scanlon study also found a shift toward increased service intensity during the study period. Thus, the combined evidence from these two studies indicated an increase in service provision and in the complexity of some of the services provided to Medicare during the price control period and a decline in the rate of service increase following the removal of controls.

Both the Paringer and Holahan-Scanlon studies found that the Medicare allowed amounts were constrained during the price control period. Billed charges rose faster than allowed amounts although they too appeared to be somewhat constrained by the Economic Stabilization Program. In the year following removal of controls, billed charges for Medicare services rose substantially. Allowed amounts also rose although their increase was more limited because physicians had limited the increase in their charges during the control years. Since allowed amounts are based on billed charges in a previous year they adjust with a lag to the removal of price controls.

While we have attributed most of the changes in Medicare revenue to the effect of price controls, there were a number of other changes in the medical care marketplace which occurred during the time. These included rapid increases in malpractice insurance premiums, growth in physician supply, increases in unemployment, etc. While these factors make it difficult to attribute outcomes solely to the effect of price controls it nevertheless appears that ESP exerted a significant impact on the behavior of physicians participating in Medicare. Econometric analysis by Hadley and Lee of the data described by Holahan and Scanlon supported the latters' earlier findings on the effects of the ESP program.[3] While Holahan-Scanlon and Hadley-Lee studied different physician specialties than those reported here, the consistency in the findings in those two analyses suggest that a more rigorous analysis would support the view that ESP influenced the behavior of the physician specialties examined in the Paringer study.

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[3] Jack Hadley and Robert Lee, "Toward a Physician Payment Policy: Evidence from the Economic Stabilization Program," Policy Sciences, 10, N. 2/3 1978/1979.

B. The Medicare Assignment Rates of Physicians: Their Responses to Changes in Reimbursement Policy

In the second study, Lynn Paringer examined the responsiveness of Medicare assignment rates to changes in Medicare reimbursement levels and in the prices which physicians charge private patients. Medicare reimbursement rates, or allowed amounts, may average ten to twenty percent below the price which a physician charges his private patients. Patients who are not accepted on assignment are charged the same rate as private patients. Because the coinsurance rate for Medicare patients is 20 percent of the Medicare reimbursement rate, patients not accepted on assignment actually face a coinsurance rate with respect to the total charges of 30 to 40 percent.

The assignment rate of a physician is the proportion of total Medicare services rendered to patients on assignment. Because the physician retains discretion in accepting patients on assignment, policies which are designed to limit reimbursement rates will exert a different impact on total physician expenditures depending on the sensitivity of the assignment decision to the fee restrictions. Undoubtedly, fee limits will hold down the government's share of the program costs. For patients not on assignment, any policies which restrict allowed amounts may merely shift a larger share of the Medicare burden to the recipients of services. For patients taken on assignment, a positive savings may be realized by both the program and the individual if fees are limited. By identifying the relationship between assignment rates, reimbursement rates, and the price which can be received in the private market, it should be possible to predict the assignment rate response to alternative Medicare reimbursement strategies.

The data used in this study was based on all claims paid by Medicare in northern California to a cohort of physicians over a three month period for each of four years (April through June in 1972 through 1975). The physicians are solo practitioners representing three specialties; general practice, general surgery and internal medicine. The pooled cross-section and time series nature of the sample permits one to study changes in physician behavior over time as well as differences at a point in time.

The analysis was based on a simple theoretical model which views the physician firm as a monopolistic competitor and is able to predict the assignment rate responses of certain groups of physicians to changes in private prices and Medicare reasonable fees. The theoretical model demonstrated that physicians will vary in their responsiveness to changes in reimbursement rates. Paringer showed that physicians participating in both Medicaid and Medicare should exhibit different responses to changes in the price variables than physicians who participate only in Medicare. It is assumed that physicians prefer Medicare patients to Medicaid because of higher reimbursement rates. Physicians with Medicaid patients are presumed to be treating all the Medicare patients seeking their care and to be willing to take more at existing payment rates. Thus increases in Medicare reimbursement rates should not increase the number of Medicare patients. The result is that the assignment rates of physicians with non-trivial Medicaid participation were not expected to respond positively to increases in reasonable fees. This result led to the inclusion of interaction terms between a physician's Medicaid participation status and his billed charge and reimbursement rate when specifying the empirical model.

A second important implication of the model was that increases in reimbursement rates fees would induce physicians to increase the private prices of their services. The magnitude of this response depends on the nature of the demand curve facing the physician. Because of the relationship between price and reimbursement rates, any effort to close the gap between the two revenue variables by raising reimbursement rates will be met by further increases in price, which will act to partially widen the gap once again.

Several other important propositions were derived from the model:

- Increasing reimbursement rates fees will reduce the quantity of services demanded by patients currently on assignment. An increase in reimbursement rates will reduce the out-of-pocket price of non-assigned patients and increase quantity demanded in the short-run. The effect through the demand side is to reduce the assignment rate.
- Physicians not participating in Medicaid will increase assigned output as reimbursement rates rise. Thus non-assigned output will also increase in the short-run because of the demand response making the impact of a change in reimbursement rates on the assignment rate ambiguous.
- In the long run, the effect of an increase in reimbursement rates on increases in private prices will act to dampen the increase in non-assigned output for both Medicaid participating and non-participating physicians.
- Increases in private demand will increase private price and reduce non-assigned output.
- Among physicians not participating in Medicaid an increase in private price will cause a shift from assigned services to private services. Since both assigned and non-assigned output will decrease, the effect on the assignment rate is ambiguous.

In the empirical research, Paringer estimated the elasticity of the assignment rate to private prices and Medicare reimbursement rates. (Elasticity measures the percentage change in the assignment rate for a small percentage change in private charges or Medicare rates.) Multiple regression analysis was used to estimate equations with the assignment rate as the dependent variable. The physician's Medicare assignment rate was defined as the proportion of relative value scale (RVS) units provided to Medicare beneficiaries on assignment. Assignment rates were also defined as the proportion of surgical and medical procedures provided on assignment. Finally, Paringer estimated assignment rate regressions for physicians with small, medium and large Medicare practices. Physicians are required to accept assignment for low income Medicare patients who are also eligible for Medicaid. For the remainder of their patients they can choose assignment or non-assignment billing. We term the first group mandatory assignment and the second voluntary assignment. We estimated separate regressions for voluntary assignment rates and total assignment rates. The former consists of voluntary assigned services as a proportion of all services excluding the mandatory assigned. The latter consists of both mandantory and voluntary assigned services as a proportion of all services.

The results indicated that the RVS assignment rates of physicians with few or no Medicaid patients are positively related to the Medicare reimbursement rate. The assignment rate goes up when allowed fees increase. The assignment equations for medical and surgical procedures had similar results. Assignment rates of non-Medicaid participating physicians for these two classes of procedures were also quite responsive to increases in prices and Medicare rates. As predicted by the theoretical model, the assignment rates of Medicaid participants were not responsive to the revenue variables. We also found that physicians with medium and large Medicare practices were much more responsive to Medicare fees than physicians with small Medicare practices.

A one percent increase in Medicare rates was found to induce a 5.1 percent increase in the voluntary assignment rates and a 1.4 percent increase in the total assignment rate. Assignment rates of physicians with relatively more Medicaid patients are, as expected, less responsive to changes in reasonable fees. A one percent increase in Medicare rates will increase the voluntary assignment rate by 1.7 percent but will not significantly affect the total assignment rate. The net effect, aggregating across all physicians, of a one percent increase in Medicare rates is a 2.5 percent increase in the voluntary assignment rate and a .3 percent increase in the total assignment rate.

For physicians with few or no Medicaid patients, a one percent increase in private charges will reduce the voluntary assignment rate by 6.0 percent and the total assignment rate by 2.0 percent. For physicians with relatively more Medicaid patients, a one percent increase in billed charge will reduce the voluntary assignment rate by 2.8 percent and the total assignment rate by .6 percent. The net effect of a one percent increase in billed charges is a 3.6 percent reduction in the voluntary assignment rate and a .9 percent reduction in the total assignment rate.

In all of the results presented, it should be remembered that the coefficient on the Medicare fee represents the effect of the Medicare fee on the assignment rate holding private price constant. As our theoretical model indicated, increases in Medicare fees will induce increases in the private price of services. Since the coefficient on private price is negative, the long run effect of raising Medicare rates will be partially offset by the price increase. The extent of the offset will depend on the relative size of the private price and Medicare fee coefficients and the elasticity of price with respect to changes in Medicare fees.

Using the results from the RVS assignment rate equations and assuming a number of different relationships between prices and Medicare fees, we predicted specialty specific assignment rates under three policy options: increasing Medicare fees to the level of prevailings, granting a $1.00 per service bonus on Medicare claims, and raising reimbursement rates by two percent.

The first policy option, that of increasing Medicare fees to the level of prevailings, would entail the largest increase in Medicare fees for all three specialties and is the most interesting of the three. Medicare rates for general practitioners would increase an average of 18 percent under such a policy. General surgeons would find their Medicare fees increased by about 11 percent and internists would experience about a 13 percent increase. The effect of any of the policy options on the assignment rates of physicians will depend on the responsiveness of physicians' private prices to changes in their Medicare fees. The average 1975 voluntary and total assignment rates of general practitioners were 38.8 percent and 59.2 percent respectively. Assuming an elasticity of price with respect to the Medicare fee of .5, the voluntary and total assignment rates resulting from increasing all Medicare fees to the level of Medicare prevailings would be 41.6 and 57.2 percent. The predicted assignment rates of internists and general surgeons follow a similar pattern, with voluntary assignment rates increasing and total assignment rates falling. The latter falls because the increase in demand following an increase in Medicare rates results in an increase in non-assigned services.

The other two policy options have a relatively smaller impact on Medicare fees than raising them to the level of Medicare prevailing charges. Consequently, the impact on voluntary and total assignment rates is also much smaller. In fact, the two specific changes, a $1.00 bonus or a 2 percent increase, have little effect on voluntary or total assignment rates.

The simulation results suggest that physicians will not increase their assignment rates substantially if allowed fees increase between 11 and 20 percent. In addition, such an increase will increase Medicare program costs significantly. It will also increase the out-of-pocket price of Medicare beneficiaries whose claims are currently assigned because of their coinsurance liability would be applied to the higher allowed fee. This should lead to a decline in the amount of services demanded at the Medicare rate. An increase in the Medicare rate will initially lower the out-of-pocket costs of beneficiaries with non assigned claims. However, this reduction in out-of-pocket costs will be limited in the long run because of the relationship between prices and Medicare rates.

Although the simulation results do not predict a substantial increase in the assignment rate following raising Medicare rates to the level of prevailings, improvements in medical care access among the elderly may nevertheless occur. Increasing the Medicare reimbursement rate should increase physician willingness to participate in the Medicare program and hence may increase Medicare output. Because an increase in Medicare fees will also reduce the price of non-assigned services, both assigned and non-assigned output may increase. The result could be little or no change in the assignment rate although access might be improved considerably.

Since the time period covered by this study there has been a significant change in the determination of Medicare rates. The Economic Index (described below) went into effect in 1976 and acts to constrain the rate of increase in Medicare prevailing fees. Assuming physicians increase their private fees at a rate greater than that permitted by the index, the result will be a movement toward the use of a fee schedule in the Medicare market. The Index will also modify the relationship between a physician's private price and his/her allowed fee so that current increases in private prices will have a smaller impact on the future value of a physician's Medicare reimbursement rate than was the case under the pre-Index system. The long run impact of a Medicare fee schedule on the availability of Medicare services will depend on the Medicare fee level relative to the physician's private market price. Paringer's results predicted that if the gap between the fee schedule and private price widens considerably, a decline in the willingness of physicians to provide Medicare services on assignment is likely to occur.

The simulations in this paper were performed assuming that any policy changes which increase Medicare reimbursement rates would be applied to all Medicare claims. Another alternative, however, would be to apply any bonus to claims taken on assignment only. The model suggests that such a policy would eliminate the increase in non-assigned demand resulting from an increase in Medicare fees. This effect would in turn reduce the price response to a reimbursement rate change among Medicaid non-participating physicians and should eliminate any response among Medicaid participants. The result would be a larger increase in assignment rates at a lower total cost to the program than that which would occur when rates are raised for all Medicare services.

Another option to be considered is the application of price controls to private fees. Such a policy would limit the rate of allowable increase in private prices and would hold down the costs of non-assigned as well as assigned services. The effect of such a policy on the assignment rate is not known since non-assigned prices would decrease and this should increase the quantity of services demanded. Additionally, use of price controls could result in a distortion of relative prices and lead to an inefficient allocation of resources in the medical care market.

A final policy alternative which might be effectively used to increase assignment rates with minor cost implications is to eliminate the claim by claim assignment option of physicians, requiring instead that physicians either treat all or none of their patients on assignment. Clearly under this type of policy there will be some physicians who choose to opt out of the Medicare assignment program. However, given the large number of physicians already participating in the lower priced Medicaid market, such a policy is not likely to discourage these physicians from participating fully in Medicare assignment. Hence the beneficiary cost burden could be reduced under this policy. In addition, given the large proportion of Medicare eligibles also eligible for Medicaid, a group which physicians already must accept on an all or nothing basis, it is not likely that a large number of physicians will risk losing these joint eligibles by opting out of the program. However, even under such an all or nothing program it is possible that if program fees begin to diverge markedly from private prices, we will witness a continual erosion of physician willingness to participate in assignment.

C. An Analysis of Changes in Physicians' Medicare Revenues

The third study, conducted by Margaret B. Sulvetta, examined the changes which occurred in physicians' revenues, fees, reimbursements, service provision and patient caseload under the California Medicare program during the period 1975-1978. It explored the impact of an important Medicare policy change--the imposition of the Economic Index. The Economic Index was imposed on July 1, 1975 in an attempt to limit the rate of increase in Medicare's prevailing charges. It applied to all physician services except pathology services. Increases in prevailings were limited to those justified by economic changes reflected in the Economic Index. Fiscal year 1973 prevailing charge levels (based on calendar year 1971 charges) were used as the base. The two components of this index include the nationwide average increase in earnings adjusted for changes in productivity, and the nationwide average increase in expenses of office-based physicians. The Index is applied equally to all physicians without regard to specialty or geographic area.

The analyses was performed using a data base comprised of all claims submitted in the first quarter of the year for the sample of solo practitioners in California. The specialties included in the analysis were general practitioners, general surgeons, internists, ophthalmologists, and orthopedic surgeons.

This paper updated and expanded upon the Holahan-Scanlon and Paringer studies discussed above. It differed in that it used more recent data, and contained state-wide information which permitted the development of unique counts of patients treated and physicians providing services. The latter allowed us to examine physician participation and changes in assignment rates. We also expanded our price indices to include 472 procedures.

The study found that reimbursement rates generally kept pace with billed charges throughout the period with the ratio of billed to allowed amounts staying fairly constant across time. The Index only appeared to be constraining reimbursement rates between 1975 and 1976. The increase in allowed amounts between 1975 and 1976 was substantially below that observed in subsequent years while the increase in billed charges for the same period was substantially higher than in later years. After 1976, increases in billed charges slowed and the Index increased sufficiently rapidly so that it had little constraining effect.

Some evidence of inflation in procedure coding terminology, which we called service intensity, was observed over time, particularly among assigned services. Changes in service intensity accounted for an 8 to 14 percent increase in office visit charges between 1975 and 1978 (except for internists where they were lower).

In the first year studied when the Economic Index had a clear constraining effect, voluntary assigned claims fell markedly for every specialty. Non-assigned claims increased for three specialties and remained constant for the remaining two.

For the remainder of the study period general practitioners provided fewer services on both assigned and non-assigned bases. General surgeons, internists, and orthopedic surgeons provided fewer voluntary and non-assigned services and more mandatory assigned services. Ophthalmologists provided an increased number of both mandatory and non-assigned services. The increased number of mandatory assigned services for most physicians was attributed to an increased proportion of joint beneficiaries as a result of Medicaid policy changes. The decline in voluntary assigned services and increase in non-assigned and mandatory assigned services could be reflective of shifts between the two claim types.

The number of patients treated followed a similar pattern. In 1976, there were increases of between 11 percent and 26 percent in patients seen on a non-assigned basis. At the same time there were sizable declines in patients voluntarily taken on assignment. The number of mandatory assigned patients also increased. At the same time services per patient declined for non-assigned patients (except for internists). Services per patient for voluntary assigned patients increased for two specialties and remained at the same level for two others. In general, very little change over time was observed in the ratio of ancillary services to office visits. There were two important exceptions. The ratio of pathology services to office visits increased by 46 percent for general practitioners and by 27 percent for internists.

A general trend toward reduced physician participation in the program was observed for all specialties. Of the general practitioners and general surgeons participating in Medicare in 1975, 8.7 percent were not participating in 1978. The other three specialists reduced participation by smaller percentages. Those doctors who continued to participate in the Medicare program tended to maintain larger patient caseloads.

While not a central focus of the study, Sulvetta also found that physicians accepted or refused assignment predominantly on a patient-by-patient basis rather than claim-by-claim. The overwhelming majority of patients received all services either on assignment or non-assignment, with few receiving services on a mixed basis.

Sulvetta's paper did not formally test the hypotheses set forth by Paringer in the paper discussed above. Formal econometric analyses of the effect of the Index on Medicare services was begun by Paringer in this project and is being completed in another HCFA grant. Nonetheless, Sulvetta's findings are consistent with the theoretical propositions set forth by Paringer.

The effect of the Economic Index should be to reduce allowed amounts below the levels they would otherwise be. One prediction is that fewer physicians would participate in Medicare because fees are lower at the margin. This in fact occurred. Coinsurance payments faced by patients with assigned claims are lower; this should boost patient demand. Services per patient with assigned claims either increased or remained stable in 1976. The extra billing faced by patients with non-assigned claims increased, thereby reducing their demand for services. Services per patient with non-assigned claims were shown to have fallen. It is also quite predictable that physicians would shift from assigned to non-assigned billing. This in fact occurred with the number of voluntary assigned services falling while non-assigned services increased by roughly the same absolute amount.

The net result, partially explained by the Economic Index, is a reduction in physician participation, a shift from assigned to non-assigned billing and reduced access to services. Intended to reduce program expenditures, the Index has had the additional consequence of increasing patient financial burden. Fortunately from the perspective of beneficiaries, the Economic Index did not significantly constrain increases in allowed amounts. As a result, the effects on participation, acceptance of assignment and access to services were not as strong as they might have been.

D. Medicaid Fee Controls and Physician Behavior: Preliminary Evidence From California

John Holahan, Margaret Sulvetta and William Scanlon used data on physicians services in California for the period 1974-1978 to analyze the states reimbursement policies. During the first part of this period, 1974-1976, physician fees were frozen by the state. Fees during this period were based on a usual, customary and reasonable charge system based on charges from 1968 plus 2.5 percent increase permitted in 1972.

In September 1976, California changed its reimbursement system to a uniform statewide fee schedule, thus eliminating all interphysician differences in fees. To establish the fee schedule, the state determined the average rates it was paying for each procedure. It then applied desired rate increases to each procedure. On average, the new schedule reflected a 30 percent increase for maternity care services, a 20 percent increase for primary care services and a 65 percent increase for anesthesia services. All other services received an increase of 9.5 percent. Thus fees were not only increased but relative fees were "twisted" in favor of particular procedures and in favor of physicians more likely to provide those services. Following this one time fee increase in 1976, reimbursement rates (with one exception) have remained constant for the remainder of the study period. The exception was a 7.7 percent increase in pathology fees in 1977.

Control and manipulation of fees have become important policy tools employed by state programs in their efforts to control Medicaid costs. Because of the complexity of Medicaid law and regulations, states choices of policies to control cost escalation are limited. Physician payment policy, however, is a matter of considerable state discretion and states have responded with substantial control over rates. Thus, the California policy is far from atypical. States such as New York, Massachusetts, Pennsylvania, Connecticut, Illinois, Ohio and New Jersey have kept Medicaid fees either constant for long periods of time or well below charges to private patients. The implications of these policies for access and use of services are very poorly understood.

The authors analyzed whether fee controls were effective in controlling average fees or whether average fees actually increased because of changes in the mix of services provided. We decomposed volume of services indices into changes in physician participation, patients seen per physician and services provided per patient. We then investigated whether physician participation dropped during fee controls and increased when fees were increased, whether physicians saw fewer patients when fees were controlled, whether services per patient increased due to changes in physician participation, changes in patient case mix, or because physicians provided more services to compensate for fee constraints.

The data were disaggregated by specialty and by several types of procedures. This permitted analysis of whether the supply of visits, laboratory tests or surgical procedures change in different ways. In addition it permitted more detailed analysis of the period after 1976 when fees were increased by different amounts depending on the type of procedure. Thus, we could see if some procedures began to be performed more frequently than others or whether specialties more likely to perform those procedures were more likely to increase their participation in the program.

The study used a data file based on a large sample of California solo-practice physicians. For each physician in the sample, we had claims data for all Medicaid services provided during the first three months of the years 1974 to 1978. Claims for individuals eligible for both Medicare and Medicaid were excluded because decisions to treat these patients are more likely affected by

Medicare reimbursement policies. Data on over 290,000 medical services were analyzed each year. All physicians in the sample were in practice throughout the entire period.

The results showed that despite the freeze on physicians' fees between 1974 and 1976, payments to physicians grew substantially. Increases in incomes from Medicaid were over sixty percent for pediatricians and over thirty percent for three other specialties. At the same time payments were much less than if the program had paid physicians at their billed rates. Payments to physicians increased for several reasons. First, several specialties increased reimbursement rates through billing for more complex procedures. As a result, average fees actually increased. Fees indices developed using current year service weights increased from 1974 to 1976 by 11 percent for general practitioners, 14 percent for general surgeons and 20 percent for pediatricians. Second, participation rates, defined as treating one or more patients per quarter, increased for six of seven specialties (all but obstetrician-gynecologists). Third, patients per physician increased for six of seven specialties (all but internists). Fourth, services per patient increased for four specialties and declined only slightly for the other three.

It appears then that extremely stringent fee controls did not reduce willingness to treat Medicaid patients. There are several possible explanations. There may have been a reduction in private demand due to the recession in 1974-1975. An increasing supply of physicians would also result in a reduction in private patients per physician. The result of either factor would be an increase in office capacity to treat additional Medicaid patients. At the same time, increases in Medicaid eligibility increased the number of persons able to demand care through the program. However, physicians would not be willing to treat Medicaid patients if rates were too low. It appears that even low Medicaid rates must have exceeded the marginal costs of providing services at least for many physicians. There also appeared to be an increase in the number of Medicaid patients.

Following the adoption of the fee schedule in September 1976, there was a substantial increase in Medicaid revenues for each specialty. Incomes for obstetricians increased by 35.6 percent in 1977, internists had revenue increases from Medicaid of 28.7 percent and pediatricians had increases of 28.1 percent. Fees were not increased in the following year. Payments to physicians declined but remained above 1976 levels.

The fee indices showed increases consistent with the change in policy. Obstetricians and other specialists who more frequently provided primary care services fared the best. There was little change in service intensity, so fee indices with current year service weights were not very different from those with base year weights. The fee schedule increase resulted in an increase in the ratio of Medicaid to private fees. This ratio was even greater in 1978 than it had been in 1976, because of size of the fee increase, the importance of primary care services relative to other services and a slowing in the rate of increase in private fees in 1977 and 1978.

Despite the fee increases, participation rates declined for four of the seven specialties. The reductions were slight, however. The definition of participation employed here includes many physicians who see small numbers of Medicaid patients. Since these physicians are not likely to be sensitive to Medicaid rates, this result is not surprising. The number of patients per physician is more likely to be sensitive to fees and we observed large increases in this ratio. Increases in patients per physician were particularly large for the primary care physicians who were the main beneficiaries of the fee schedule increases. Patients per physician increased by 37.5 percent for pediatricians, 36.4 percent for obstetricians, 23.4 percent for internists and 23.2 percent for general practitioners. There was an increase in Medicaid eligibility of 12.8 percent during this period; thus all of the increase in patients cannot be attributed to the increase in fees. Some of the increase in patients was offset by a decline in services per patient. On balance, however, services per physician increased.

In 1978, participation rates, patients per physician, and services per patient all generally declined. At the same time, participating physicians saw many more patients in 1978 than they did before the fee schedule increase.

In sum, the California increase in physician fees coupled with a twisting of relative fees in favor of primary care appears to have had the desired results. Primary care physicians dramatically increased the number of Medicaid patients they treated. One year later, after fees were again frozen, patients per physician fell but remained above levels prior to the fee schedule. Clearly other factors contributed to these results. Most notably, increases in Medicaid eligibility and the supply of physicians could have affected the outcome observed.

E. The Effects of Medicaid and Private Fees On Physician Participation in California's Medicaid Program, 1974-1978.

In the second Medicaid paper, Philip Held, John Holahan and Cathy Carlson employed econometric methods to disentangle the effect of changes in fees from these other factors, principally changes over the period in the number and mix of Medicaid eligibles and the number of physicians actively practicing in the state. Individual physician data were employed for the analyses and the effect of both private prices and Medicaid reimbursement rates on the supply of physician services to the Medicaid program were estimated.

The study confirmed the view that higher (lower) Medicaid fees increased (decreased) physicians' willingness to participate and supply services to the

Medicaid program other things being equal. The universal Medicaid fee schedule adopted in California in late 1976 led to both more physician participation in the program and more services supplied than would otherwise by the case.

While the number of physicians participating increases with increases in Medicaid fees, as well as with increases in Medicaid eligibility and the number of physicians per private patient, the rapid rise in private demand (prices) over the period was more than enough to offset the other three influences. Consequently, the net effect of the four factors was a substantial downward pressure on the probablity of participation in Medicaid. This does not say that the Medicaid fee increases had no effect. It merely notes that the rapid rise in private prices had a substantially offsetting influence between 1974 and 1978. While there was downward pressure on the likelihood of participating in Medicaid it should be noted that the pool of physicians was increasing dramatically in this time period. This implies that a declining participation rate would not necessarily imply a declining number of physicians willing to provide Medicaid services.

Despite the decline in participation rates, there was a large increase in supply of Medicaid services which came predominantly from participating physicians increasing their output rather than from higher participation rates. We decomposed the change in supply of Medicaid services into three component parts - total services (measured in relative value units - RVUs) per physician, RVUs per patient, and the number of different patients per physician - to measure the effect on each.

With increased Medicaid fees, total RVUs per physician increase with a Medicaid price elasticity of 0.2 to 0.4 for primary care physicians and 0.6 to 0.8 for surgeons. These elasticity estimates reflect the total effect of both the direct stimulus of the Medicaid price increase on physician supply and the opposing indirect effect which operates through private price changes. Because the increase in Medicaid fees represents an upward shift in overall demand, physicians raise their private prices. As Medicare and private insurance holders adjust to the higher prices, non-Medicaid demand rises, partially offsetting the effect of the Medicaid fee increase. The magnitude of the offsetting indirect effect is not known with certainty but a reasonable estimate is approximately 30 to 60 percent of the direct effect. That is, a substantial part of the effect of changes in Medicaid price on the Medicaid program is dissipated by the likely adjustment of the private market to the increase in Medicaid prices.

The estimated elasticity of total Medicaid RVUs with respect to the private price for both primary care and surgery is -0.45. The elasticity for patients per physician is similar in magnitude and sign. The private price elasticity of participation in Medicaid was -0.90 for both specialty groups. In essense, physicians' supply of Medicaid services is responsive to changes in private price. Hence Medicaid policies should focus on both Medicaid and private price. To influence service delivery, Medicaid fee increases must be high enough to compensate for the increases in private fees. Over the entire five year period, 1974-1978, private prices rose 35 percent while Medicaid prices were increased by 20 percent for primary care and 10 percent for surgery. On balance then, the increases in Medicaid fees were not sufficient to offset the changes in private price. For primary care the net effect of these two price changes, in the long run, is to decrease total Medicaid RVUs per physician approximately 17 percent. For surgery the decrease is approximately 9 percent. These estimates reflect our best judgment regarding the magnitude of the indirect effect of Medicaid prices on private price. In conclusion, the Medicaid price increase in 1976 was substantial and clearly had strong effects on physicians' response to the Medicaid Program. However, on balance, the change was not sufficient to totally offset for the period as a whole the effects of the rapid rise in private prices.

Increases in Medicaid fees had their primary effect through physicians' willingness to treat more patients. There were substantial increases in the number of different Medicaid patients seen per physician with Medicaid price elasticities averaging .6 for primary care physicians and 1.1 for surgeons. These estimates are for the total effect of Medicaid price, i.e., they are the net of the direct and indirect effect of Medicaid price on physician behavior. The increase in patients per physician has important implications for access and possibly implies reduced use of hospital outpatient departments and emergency rooms.

The increase in RVUs per physician in response to an increase in fees is substantially less than the increase in the number of patients seen by each physician. The difference is accounted for by a reduction in RVUs per patient. There are at least two potential explanations for such phenomena. First, as the number of patients seen by a physician increases, access to care increases implying that patients see more different physicians and the average RVU per patient decreases. Under this explanation patients obtain more total services, even if the number obtained from each physician decreases. The second potential explanation is that the easier patient access, brought on by participating physicians being more willing to see Medicaid patients, is accompanied by patient mix changes. In other words, more healthy patients are brought into the system under the higher Medicaid price, and they require fewer RVUs per patient. We are unable to distinguish between these explanations because our data is physician-specific and we cannot trace the movement of patients among physicians.

We also estimated the effect of changes in the supply of physicians on participation in Medicaid. This will become of increasingly greater policy relevance as the number of physicians grows substantially in the coming years. By 1990, it is projected that there will be close to 600,000 active physicians and osteopaths as compared with 323,000 in 1978, a 5.3 percent compound annual rate of growth.[4] Adjusting for projected changes in the population, this will mean that in the same period, the number of persons per physician will fall from 518 to 409 representing a compound annual rate of decline of 2.8 percent.

Our results suggest that primary care physicians may become more willing than they would otherwise be to supply services to the Medicaid program. The supply to Medicaid was estimated to be fairly elastic with respect to physicians per capita. Point estimates were 0.8 to 1.10 for total RVUs and 0.4 for Medicaid patients per physician. The effect of the change in the physician supply over the period 1974 to 1978 was reasonably large. For example, over the entire five year period, the change in the physician supply led, other things equal, to the average primary care physician treating 5 percent more Medicaid patients and supplying 15 percent more total RVUs to Medicaid. For surgery, however, the change in the physician supply had very small effects on the supply of Medicaid services.

One potential consequence of increases in physician supply then is that total Medicaid expenditures for physician servoces may increase even if fees are strictly limited or reduced because, as the supply increases, physicians may be more willing to treat Medicaid beneficiaries. Viewed from a different perspective, states could achieve the same access or utilization objectives with lower physician fees than would otherwise be the case because of the increasing supply of physicians.

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[4] U.S. Department of Health, Education and Welfare, A Report to the President and Congress on the Status of Health Professions Personnel in the United States, August 1978, p. 11-30.

These results show that the physicians respond predictably to changes in Medicaid fees. Consequently, the setting of Medicaid fees, in terms of both their absolute level and, differentials among procedures, offers a substantial policy instrument for affecting the direction and cost of the Medicaid program. Finally, the increasing supply of physicians is also having predictable effects on physician behavior and while this factor is not a ready policy instrument, the predicted growth in the supply of physician presents cost saving opportunities to state Medicaid programs.

F. The Provision of Medicaid Services by Group Physicians

In this paper, Cathy Carlson extended the Holahan, Scanlon and Sulvetta work to analyze and compare the responses of urban group and solo practitioners to changes in Medicaid pricing policy. Data on Medicaid claims submitted by group and solo practitioners in Los Angeles and San Francisco counties are contrasted for the years 1974, 1976 and 1978. Six specialties were included in the analysis: general and family practice, internal medicine, obstetrics-gynecology, pediatrics, general surgery and orthopedic surgery. One objective was to see if the results of the other studies of solo practice physicians could be generalized to group physicians.

The sample providers were drawn from the groups and solos who had Blue Shield identification numbers regardless of whether they had Medicaid claims. Physicians usually obtain Blue Shield numbers upon licensure, hence this population includes nearly all California physicians. To facilitate comparison with solos, only single-specialty groups were selected. Group practices, in contrast with solo doctors, are heavily concentrated in urban areas. If we were to compare group to solo physicians for the entire state, the differences we report could well be do to differences in location rather than type of practice. To avoid this problem we created samples of group and solo physicians located in Los Angeles and San Francisco counties.

The results demonstrated that there were several differences between group and solo practice patterns. Groups differed from solos in the following ways:

- Group practice Medicaid fees and billed amounts were higher because the services provided were more complex.
- Group Medicaid practices were larger than solos, and the number of patients seen during the study period increased faster for groups than solos.
- Groups provided more pathology and radiology services per patient, possibly due to differences in equipment ownership.
- The number of services per patient fell more for groups than solos followng the fee increase in 1976.
- Groups had higher participation rates than solos, and their rates did not decline between 1976 and 1978.

The primary conclusion of this paper, however, is that although groups provided more expensive services than solos and provided a greater volume of services, they did not differ greatly from solos in their responses to fee policy changes. Between 1974 and 1976 total gross revenues from Medicaid increased only for the primary care specialties. Revenues for the sample groups increased by 65 percent for general practitioners, 70 percent for internists, 115 percent for pediatricians and 88 percent for obstetricians. Revenues fell by 26 percent for general surgery groups and by nine percent for orthopedic surgeon groups. Increases in the number of patients per group were in general the greatest contributors to increases in revenues. For example, patients per provider increased by 15 percent for general practitioners, 49 percent for obstetricians and 41 percent for pediatricians.

Despite the freeze on fees, average prices rose for pediatricians and general practitioners. The price increases were due primarily to increases in service complexity. Average reimbursement rates actually fell for the other specialties, principally due to declines in service intensity. A reduction in service intensity was reflected in lower average prices.

A third source of increased revenues was the increase in the number of services per patient. With few exceptions, services per patient increased faster for groups than solos. For many practitioners the average prices and services per patient were offsetting, limiting the change in revenue per patient. Finally, participation rates rose during the 1974-1976 period for five of the six specialty groups. Group participation rates grew faster and continued to be higher than solo physicians'.

Between 1976 and 1978, average allowed amounts rose for all physicians. The price increases reflected the fee increase and were higher in the primary care specialties as expected. The number of patients treated continued to rise rapidly, especially in obstetrics-gynecology and pediatrics. Between 1976 and 1978 patients per group increased by 63 percent for general practitioners, 137 percent for obstetrician-gynecologists and 215 percent for pediatricians. The increases in patients seen were generally larger for groups than for solo physicians. The number of patients seen by groups was also augmented by continued large increases in participation rates. Participation rates increased by 17 percent for general practitioners, 47 percent for internists, 27 percent for obstetrician-gynecologists and 44 percent for pediatricians.

In contrast to the earlier period, the numbers of services per patient fell substantially after the fee increase, and were below 1974 levels in general practice, general surgery, obstetrics-gynecology and pediatrics. It appears that physicians spread their services across a larger number of patients, with each receiving fewer treatments.

G. A Comparison of Practice Patterns of New and Established Physicians: California, 1978

The objective of the final paper by Helen L. Smits was to determine whether or not there are measurable differences between the billing and practice patterns of new physicians as opposed to those who have established practices. The data base was the Urban Institute's sample of California solo practice physicians, augmented with a sample of physicians obtaining Blue Shield numbers in the mid 1970's. For every physician in the sample, all claims submitted to Medicare or Medicaid during the first quarter of 1978 were included. Data were analyzed for three specialties: general (or family) practice, general surgery and internal medicine. Claims data for each specialty were analyzed for two groups: those who were defined as "new" and those who were considered "established." In order to avoid peculiarities attributable to the difficulties of first establishing a practice, we used a cohort of "new" physicians who had been in practice for over two years at a time of study. Established physicians had been in practice five years or longer.

There were four issues which this particular data base allowed us to examine concerning differences between new and established physicians. First, were new doctors as willing to see Medicare and Medicaid patients as established doctors? Second, did they see larger or smaller numbers of these patients? Third, did they charge more per service or bill the program using higher valued procedure codes? Fourth, did they differ in the kinds and frequency of services delivered?

Our data showed that physicians who had recently entered practice differed from their more established counterparts in a variety of ways. We found that established physicians were more likely to participate in both Medicare and Medicaid than their new counterparts in the same specialty. Among those who participated in Medicare, established physicians also saw more patients on the average than did new physicians. The pattern within Medicaid was reversed, however, with new participating physicians seeing more patients per physician than established participating physicians.

The most striking differences between new and established physicians were found in charging practices. New physicians generally charged more, and were allowed more, than established physicians. Although the higher billings were associated with slightly higher prices per RVS unit, the major cause of the increase was higher RVS intensity in almost every group of services. Within procedure groups such as office visits higher RVS values are presumably attributable to a tendency among new physicians to use more intensive codes in describing the same service than would established physicians. A seven-minute office visit, for example might legitimately be described as "minimal," in which case it would be worth 2.4 units, or as "brief" (3.5 units) or as "limited" (5.2 units). New physicians used more of the higher, and established physicians more of the lower, codes.

In areas such as surgery, where codes are related to specific procedures, higher RVS values indicate the provision of different, more intensive, groups of services. In these service-specific areas, we found surgery performed by "established" general and family practitioners on Medicaid patients is considerably more intensive than that performed by "new" members of the same specialty. This observation was also true, but less pronounced, within Medicare.

New doctors did not seem to see patients more often or to order many more ancillary tests per patient than established physicians. Some specific trends, such as the marked tendency for new surgeons to bill for more pathology services than old surgeons, were observed, but this could be attributed to the organization of office practice rather than to trends in test ordering.

In summary, then, new physicians differed most markedly from older physicians in areas relating to the economic aspects of practice: that is, in the relative numbers of Medicare and Medicaid patients seen and in their billing patterns. New physicians did not, on average, see their patients more often or order more laboratory tests.

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